

New Mexico Health and Environment Department

APPENDIX A

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED



MARALYN BUOKE  
Acting Secretary

CARLA L. MUTH  
Deputy Secretary

MICHAEL J. BURKHART  
Deputy Secretary

RICHARD MITZELFELT  
Director

August 11, 1989

Colonel David E. Benson  
Base Commander  
Headquarters 27th Combat Support Group/CC  
Cannon Air Force Base, NM 88103

RE: NM7572124454  
Notice of Violation

Dear Colonel Benson:

Between October 25 and October 26, 1988, EPA Region 6 staff conducted an EPA-lead Comprehensive Groundwater Monitoring Evaluation (CME) at Cannon AFB. This letter is the New Mexico Environmental Improvement Division's (EID) notice that based on the review of the CME and a record review, EID has determined that Cannon AFB has violated the New Mexico Hazardous Waste Management Regulations (HWMR-5, as amended 1989), 40 CFR, Part VI section 265. The purpose of this letter is to delineate in writing the violations and to require Cannon AFB to comply with HWMR-5.

The following violations of HWMR-5, as amended 1989, pertain to Cannon AFB's Ogallala aquifer groundwater monitoring system (MW-A, MW-B, MW-C, MW-D, MW-I and MW-J) for Landfill 5 Cell 3.

1. Cannon has not installed an upgradient well(s) screened at depths to yield groundwater samples representative of the uppermost aquifer near the facility and has not installed downgradient wells that are screened at depths to ensure that they will immediately detect contamination migrating from the Landfill 5 Cell 3 RCRA unit as required by Pt. VI, sec. 265.91(a)(1),(2). Specifically, the screen in the upgradient well does not intersect the water table, therefore, groundwater samples collected from that well are not representative of the groundwater near the facility. The screens in the downgradient monitor wells do not intersect the water table, therefore, the wells cannot immediately detect non-aqueous light phase layers that potentially could be present at the water table interface.

Colonel Benson  
August 11, 1989  
Page 2

Under unconfined water table conditions, the screens should intersect the water table thereby ensuring the detection of potential light phase immiscible constituent layers. Constituents received in Landfill 5 Cell 3 include light non-aqueous phase liquids.

2. Cannon has not developed an adequate groundwater sampling and analysis plan as required by Pt. VI, sec. 265.92(a). The sampling and analysis plan is inadequate in detail and should be expanded. The following specific inadequacies need to be addressed: 1) samples for organic analyses were collected in polypropylene containers instead of fluorocarbon resin or glass containers; 2) Total Organic Carbon (TOC) analyses were not preserved with acid; 3) sample labels and chain-of-custody seals were not prepared at the time of sample collection and affixed to the containers to assure identification and proper chain-of-custody; 4) the chain-of-custody record was not prepared and inserted with the sample containers; 5) there is no procedure to contain and dispose of purged groundwater from the wells if the purge water is analytically determined to contain hazardous constituents; 6) the procedure to calculate five well volumes as outlined in the Sampling and Analysis Plan was not followed (purge water was allowed to flow on to the ground); the size of containers and type of container lids were not specified; and 7) the order of sample collection was not specified.
3. Cannon's groundwater sampling equipment is inadequate to obtain a sample representative of the groundwater in the uppermost aquifer as required by Pt. VI, sec. 265.90 (a). Sampling equipment is inadequate for collection of representative samples for pH, volatiles, semi-volatiles, metals, TOX and other labile constituents. Specifically, a groundwater sample from the monitor wells would not be representative because of the agitation and aeration caused by the usage of the submersible pump to collect the samples.
4. Cannon's field log did not record details of the care and maintenance of sampling equipment as required by Pt. VI, sec. 265.15 (d). Field notes were not maintained on the maintenance of the water depth probe, its malfunctions and the resolution of those problems.
5. Monitor well J's construction is inadequate to maintain the integrity of the monitoring well bore hole as required by Pt. VI, sec. 265.91 (c) or Monitor Well J was developed inadequately to obtain a sample representative of the

Colonel Benson  
August 11, 1989  
Page 3

groundwater in the uppermost aquifer as required by Pt. VI, sec. 265.90 (a). Water samples collected from Monitor well J contained sand indicating that the well was not properly completed or developed.

In accordance with the New Mexico Hazardous Waste Act NMSA 1978, Section 74-4-10, you have thirty (30) calendar days from the receipt of this notice to provide documentation that the aforementioned violations have been corrected. Within this thirty day period you may request a meeting to discuss the violations, the required corrective actions and/or a settlement agreement. Such a meeting must be held within this thirty day period and will not suspend the thirty day deadline for compliance or settlement.

If you fail to correct the violations cited in this Notice of Violation (NOV) within the specified time frame, you shall be subject to one or more of the following:

1. An order requiring compliance within a specified period, pursuant to Section 74-4-10 NMSA 1978, and/or an order assessing civil penalties of up to \$10,000 per violation for each day of continued noncompliance, pursuant to Sections 74-4-10 and 74-4-12 NMSA 1978.
2. a civil action in district court for appropriate relief, including a temporary or permanent injunction, pursuant to Section 74-4-10 NMSA 1978, and/or the assessment of civil penalties of up to \$10,000 per violation for each day of continued noncompliance, pursuant to Sections 74-4-10 and 74-4-12 NMSA 1978.

Any settlement reached shall be finalized upon the issuance of a written settlement agreement by the Director of EID. This issuance of a settlement agreement shall constitute a waiver on your part to request a hearing pursuant to this NOV.

Compliance with the requirements of this notice does not relieve Cannon AFB of its obligation to comply with HWMR-5 in other activities which it carries on, nor does it relieve Cannon AFB of its obligation to comply with any other applicable laws and regulations.

Attachment 1 includes a list of technical deficiencies noted during the CME. EID strongly suggests that Cannon AFB correct these deficiencies as soon as possible. The concerns set out in

Colonel Benson  
August 11, 1989  
Page 4

Attachment 1 paragraphs four and five has prompted EID to copy this letter to Mr. Males of the federal Occupational Safety and Health Act Office.


In addition, Cannon AFB's post closure permit application has been called by EID and EPA and submitted by Cannon AFB. Cannon AFB is now subject to sampling the monitor wells and analyzing for Appendix IX constituents under Pt. IX, sec. 270.14 (c)(4).

The Hazardous Waste Program is not citing any deficiencies in the application at this time and has deferred a detailed review of the post closure permit application until a later date.

EID has received Cannon AFB's revised Sampling and Analysis Plan and will review and send comments to Cannon AFB within 15 days from the date of this NOV.

If you have any questions regarding this notice, please contact Suzanne Moore-Mayne at (505) 827-0170 or at the above address.

Sincerely,

  
Jack Ellvinger, Chief  
Hazardous Waste Bureau

JE/SMM/smm

cc: Lynn Prince, U.S. EPA Region VI (6H-HS)  
Garrison McCaslin, District IV  
Jim Males, Area Director, OSHA

## Attachment 1

### Technical Deficiencies Noted during the CME

1. During the CME inspection, it was observed that the water depth probe was placed in contact with the ground on several occasions. Care should be taken to prevent any possible cross-contamination or contamination of equipment placed in the wells.
2. Portable generators were used to power the well pumps. The generators were located adjacent to the wellhead. NMEID suggests that generators be placed such that the fumes do not contaminate the samples.
3. Tap, deionized or distilled water should be used to clean the water depth probe after measuring the depth to water in a well.
4. During the inspection, it was noted that unsealed samples were placed in a refrigerator with food and soft drinks. NMEID recommends that samples be placed in a container specifically for samples. They should be separated from normal use areas for chain of custody, safety and hygiene reasons.
5. Sampling personnel failed to wear protective clothing such as gloves, coveralls, safety boots or booties, and splash protective glasses or goggles. If the groundwater is determined to be contaminated, then a photoionization or flame ionization device should be used to test the working space at the well.
6. Groundwater monitoring wells I and J did not have identification on them until the sampling team marked them with an indelible pen during the CME inspection. These wells should have identifications painted on the casing.
7. Trip blanks and field blanks were not collected for analyses during the CME inspection. Trip blanks are used to determine what conditions are present during the time the sample bottles and samples are in the field (away from the laboratory). Field blanks are taken to determine possible effects of the field conditions on the sample collection.

APPENDIX B

**New Mexico Environmental Improvement Division  
Hazardous Waste Program Policy  
for  
RCRA Groundwater Monitoring System Design, Construction,  
and Certification Requirements**

- A. The facility shall design, construct, and maintain the ability to monitor area ground water on a permanent basis in accordance with Part VI (40 CFR Part 265), Subpart F. The facility shall construct and maintain a groundwater monitoring system which yields upgradient groundwater samples which represent the background quality of groundwater that has not been affected by facility operations and also samples which represent the quality of ground water passing the point of compliance.

Groundwater monitoring at the facility shall, at a minimum, consist of a monitoring system for the uppermost aquifer and any interconnected aquifers. Individual flow zones within the aquifer will have separate monitoring systems.

- B. The facility shall construct each new groundwater monitoring well at the facility consistent with the Technical Enforcement Guidance Document, OSWER 9950.1, September 1986, and in accordance with the design specifications below:

1. The facility shall use a well drilling method which minimizes potential adverse effects on the quality of water samples withdrawn from the well and prevents communication between flow zones or aquifers during drilling and construction operations.

Drilling fluids and cuttings shall be containerized and analyzed using EPA approved SW-846 methods. If hazardous constituents are present, the drilling fluids and cuttings shall be disposed of as hazardous waste.

RCRA Groundwater Monitoring  
System Policy  
Page 2

2. The well casing shall be constructed of stainless steel, polytetrafluoro-ethylene (PTFE) or schedule 40 or 80 polyvinyl chloride (PVC) (rigid) pipe with flush threaded connections. Solvent cementing compounds or stainless steel screws shall not be used to bond joints. The PVC casing must bear the National Sanitation Foundation logo for potable water applications (NSF-pw) or be American Society of Testing Materials (ASTM) approved PVC. Only stainless steel or PTFE well casing or screen shall be used below and including the static water level within the well.
3. A tailpipe or sump shall be installed unless it would breach a confining unit or jeopardize the function of the well. The sump shall extend below the screen no more than five feet and shall be constructed of inert materials. The sump must be capped with an inert bottom cap and shall be incased in bentonite.
4. The facility shall design and construct the intake portion of a well so as to allow sufficient water flow into the well for sampling purposes and to minimize the passage of formation materials into the well during pumping.

The intake portion of a well shall consist of commercially fabricated slotted screen with openings as determined by a sieve analysis conducted on the interval to be screened, over no more than a ten (10) foot span.

The annular space between the slotted screen and the borehole shall be filled with inert, siliceous granular material (i.e., filter pack) or natural filter pack, which has a proper size gradation to provide mechanical retention of the formation sand and silt and prevent turbidity measurements greater than five (5) nephelometric turbidity units (NTUs), formazin turbidity units (FTUs) or Jackson turbidity units (JTUs) (Note B.5. below). Natural filter pack shall retain forty (40) percent of the formation material; introduced filter pack shall retain ninety (90) percent of the filter pack material.

Centralizers shall be used to ensure the adequate emplacement of the filter pack and annular sealant. The centralizers shall be constructed of inert material.

The filter pack shall not be placed deeper than two feet below the base of the screen. Specific guidelines for location of screened intervals are as follows:

- a. For a confined zone, the screen shall be positioned adjacent to the uppermost ten (10) feet or less of the saturated zone.
- b. For an unconfined zone, the screen shall be positioned adjacent to the upper ten (10) feet or less of the saturated zone and the screen shall extend two (2) feet above the seasonal high water table.
- c. To monitor dense phase immiscibles, the screen shall be placed adjacent to the lowermost ten (10) feet or less of the saturated zone to be monitored and shall extend to the lower confining unit.

Alternative well installation methods may be proposed, in writing, with documentation of effectiveness. The Director's approval shall be obtained prior to the use of such alternatives.

5. Upon completion of installation, the monitoring well shall be developed to remove any fluids used during well drilling and to remove fines from the natural formation to provide particulate-free discharge of less than five (5) NTUs, FTUs or JTUs or equivalent. For any well which cannot be developed to this standard, the facility may request in writing a variance to this requirement. Such request must describe the efforts to achieve this standard and all test data collected on this well.
6. The facility shall seal the annular space between the well casing and the borehole above and below the slotted screen portion of the well so as to prevent flow in this zone.



All annular sealants will be emplaced as slurries by means of a tremie pipe. The facility must ensure that the sealant is placed using a method to prevent bridging of the sealant.

If a sump is placed below the screen, the annular space surrounding the sump shall be sealed with additive-free bentonite to within two feet of the base of the screen.

After the filter pack is in place around the screen, a buffer zone of twelve to eighteen inches of fine sand or dry bentonite (granulated or chips) shall be emplaced above the filter pack.

A five foot bentonite seal shall be emplaced with a tremie pipe above this buffer zone. The bentonite seal shall be allowed to set before the bentonite-cement seal is emplaced.

A bentonite-cement seal shall be emplaced as a slurry in a continuous process to the surface using a tremie pipe. An adequate cement-bentonite grout sealant is two (2) to eight (8) percent bentonite by weight of cement having a density of twelve to fourteen pounds per gallon. Bentonite containing additives is unacceptable in sealants.

Alternative sealing methods may be proposed, in writing, with documentation of effectiveness. The Director's approval shall be obtained prior to use of such alternatives.

7. Each well shall be equipped with a locking cap and provided with a cement collar at the surface to divert drainage away from the casing. The cement collar shall measure a minimum of three (3) feet by three (3) feet by four (4) inches thick.

The wellhead shall extend below the frost line and shall be designed to minimize potential frost effects on the integrity of the monitor well. The well head is the surface structure expression of the monitor well including the surface casing and protective well covering.

If motor vehicles can approach the well the above ground portion shall be protected with posts or other barriers.

In circumstances requiring a below grade wellhead configuration, the facility shall submit the wellhead plans and reasons for a below grade configuration to the Director. The Director's approval shall be obtained prior to implementing construction.

Alternative completion methods may be proposed, in writing, with documentation of effectiveness. The Director's approval shall be obtained prior to use of such alternatives.

- C. The facility shall complete construction of each monitoring well in accordance with the requirements of this and shall certify such proper construction.

Each monitoring well certification shall be accompanied by a certification report, including the location of the well by longitude and latitude, and an accurate log of the soil boring which thoroughly describes and depicts the drilling information, location of sample collection, moisture conditions and soil and lithology descriptions encountered in the boring of the well.

In addition, a construction log shall be submitted for each well. This log shall depict the dimensions, elevations, materials of construction and depths of the filter pack, bentonite seal, bentonite-cement seal, sumps, casing, screen, total depth, screen slot size, filter pack grain size, surveyed elevation of top of casing, etc.

The facility must complete a "Monitor Well Identification Report" for each well. These Report forms will be provided by the Director.

- D. The well number and a surveyed elevation measurement reference mark shall be permanently marked on the top of each well casing installed pursuant to RCRA.
- E. The surveyed elevation of the top of each well casing

shall be on file at the facility.

- F. The facility shall measure the water elevations, sample, operate, and maintain the wells in a manner which ensures that samples obtained are representative of in-situ ground water quality, and which follows the procedures described in the Sampling and Analysis Plan.
- G. The facility shall use sampling, sample accounting, handling, and quality control procedures which are in accordance with EPA-approved procedures and as outlined in the Sampling and Analysis Plan. The latest edition of Test Methods for Evaluating Solid Waste: Physical/Chemical methods, SW-846, shall be used whenever applicable.
- H. The facility shall enter all monitoring, testing, and analytical data obtained or prepared pursuant to the requirements of the permit, including graphs, reports, logbooks, field notes and drawings, in the operating record at the facility.
- I. The facility shall replace any monitoring well which is removed from service with an adjacent monitoring well or with one at a different location if it is determined by the Director that replacement at a different location is appropriate. The replacement well shall be installed in accordance with Attachment 1. The facility shall notify the Director verbally and in writing at least ten (10) calendar days prior to removing the well from service. The Director may determine a replacement well is not necessary.
- J. The facility shall plug soil test borings deeper than five (5) feet and monitor wells removed from service to prevent the preferential migration of fluids in the area of the borehole. Soil test borings and monitor wells shall be plugged using a method(s) to prevent cross contamination between flow zones or aquifers. A bentonite slurry shall be emplaced using a tremie pipe.

Plugging methods shall be proposed, in writing, with documentation of effectiveness. The Director's approval shall be obtained prior to use of such alternatives.

APPENDIX C

MONITORING WELL IDENTIFICATION REPORT

ENVIRONMENTAL IMPROVEMENT DIVISION  
HAZARDOUS WASTE SECTION  
1190 ST. FRANCIS DR./HAROLD RUNNELS BLDG.  
SANTA FE, NEW MEXICO 87503

FACILITY NAME \_\_\_\_\_

EPA I.D. NUMBER \_\_\_\_\_

COUNTY \_\_\_\_\_

WELL NUMBER \_\_\_\_\_

WELL LOCATION (LONGITUDE) \_\_\_\_\_

WELL LOCATION (LATITUDE) \_\_\_\_\_

AQUIFER NAME \_\_\_\_\_

AQUIFER CONFINED \_\_\_\_\_ UNCONFINED \_\_\_\_\_

WELL INSTALLATION DATE \_\_\_\_\_

DRILLING METHOD \_\_\_\_\_

INNER CASING DIAMETER \_\_\_\_\_

BOREHOLE DIAMETER \_\_\_\_\_

CASING MATERIAL \_\_\_\_\_

METHOD OF DEVELOPMENT \_\_\_\_\_

ELEV BOTTOM OF BOREHOLE \_\_\_\_\_

ELEV BOTTOM OF WELL CASING \_\_\_\_\_

ELEV BOTTOM OF SCREENED INT \_\_\_\_\_

ELEVATION OF SCREENED INT \_\_\_\_\_

SURVEYED ELEV OF CASING TOP \_\_\_\_\_

DATE OF REPORT \_\_\_\_\_

SIGNATURE \_\_\_\_\_

NAME (TYPED) \_\_\_\_\_

b:wellid/bas

**MONITORING WELL IDENTIFICATION REPORT**  
**INSTRUCTION MANUAL**

**Facility Name:**

Enter the facility's official or legal name.

**EPA I.D. Number:**

Enter the facility's EPA identification number.

**County:**

Enter the New Mexico county where the facility is located.

**Well Number:**

Enter the well number or well name that corresponds with the data being entered.

**Well Location:**

Enter the longitude and latitude coordinates of the well number being identified to the nearest 0.1 second.

**Aquifer Name:**

Give the name of the aquifer from which groundwater is being extracted by the monitor well.

**Aquifer Confined/Unconfined:**

Please indicate if the aquifer is confined or unconfined by entering an X in the space provided.

**Well Installation Date:**

Enter the month/day/year the monitor well was installed.

**Drilling Method:**

Please look at Table 1 and enter the applicable abbreviation in the space provided.

TABLE 1

<u>Drilling Method</u>	<u>Abbreviation</u>
Air rotary.....	AIRRT
Bored or augered.....	BORE
cable-tool.....	CABLE
Dug.....	DUG
Hydraulic rotary.....	HYDRT
Jetted.....	JET
Air percussion.....	AIRPR
Reverse rotary.....	RVRT
Driven.....	DRIVN
Drive - wash.....	DWASH
Trenching.....	TRNCH
Solid auger.....	SLDAG
Bucket auger.....	BKTAG
Hollow auger.....	HLWAG
wire line.....	WLINE
*Other	

\*Please type in the drilling method used.

Inner Casing Diameter:

Enter the inner diameter of the casing to the nearest 0.1 inch. Do not give the diameter of the outer protective casing.

Borehole Diameter

Enter the inner diameter of the borehole as it was initially drilled.

Casing Material:

Please look at Table 2 and enter the applicable abbreviation in the space provided.

Table 2

<u>Well Casing Material</u>	<u>Abbreviation</u>
Brass or bronze.....	BRSBZ
Stainless steel 305.....	SS305
Stainless steel 316.....	SS316
Steel.....	STEEL
Galvanized iron.....	GALFE
Wrought iron.....	WRTFE
Concrete.....	CNCRT
PVC.....	PVC
Fiberglass.....	FBRGL
Teflon.....	TEFLN
*Other	

\* Please type in the well casing material used so that the New Mexico Environmental Improvement Division may assign an abbreviated value.

Method of Development:

Please look at Table 3 and enter the applicable abbreviation in the space provided.

TABLE 3

<u>Method of Development</u>	<u>Abbreviation</u>
Air lift.....	AIRFT
Bailed.....	BAILD
Blown or surged with compressed air.....	COMPR
Washed or jetted.....	WJTTD
Pumped.....	PUMPD
Surged with surge block.....	SRGBL
None.....	NONE
*Other	

\* Please type in the method of well development used so that NMEID may assign an abbreviated value.

Elevation of Bottom of Borehole:

Give the elevation of the bottom of borehole in feet, tenths and hundredths of feet above mean sea level.

Elevation Bottom of Well Casing:

Give the elevation of the bottom of well casing in feet, tenths and hundredths of feet above mean sea level.

Elevation Bottom of Screened Int:

Give the elevation of the bottom of screened interval in feet, tenths and hundredths of feet above mean sea level.

Elevation Top of Screened Int:

Give the elevation of the top of screened interval in feet, tenths and hundredths of feet above mean sea level.

Elevation of Casing Top:

Give the surveyed elevation of the top of the monitor well casing above mean sea level to the nearest 0.01 foot. Do not give the elevation of the top of the outer protective casing.

Date of Report:

Enter the date in which the report was completed.

Signature:

Please put your signature in the space provided.

Name (Typed):

Please type your name in the space provided.



APPENDIX D

CANNON AIR FORCE BASE  
COMPLIANCE SCHEDULE

<u>Item Number</u>	<u>Days from Signing of Agreement</u>	<u>Action</u>
1	60	Cannon submits the turbidity sample results from monitor well J.
2	60	Cannon submits the drilling and installation plan for the dry borehole downgradient monitor well to EID.
	90	EID provides written comments to Cannon regarding the plan.
	111	Cannon submits revised plan to EID with EID comments incorporated.
	126	EID provides final written response to Cannon regarding revised plan.
	216	Cannon shall complete installation and development of the monitor well.
	246	Cannon shall certify to EID in writing that the well was installed in accordance with the approved plan.
3	231	Cannon submits the drilling and installation plan for the additional downgradient monitor well to EID.
	261	EID provides written comments to Cannon regarding the plan.
	282	Cannon submits revised plan to EID with EID comments incorporated.
	297	EID provides final written response to Cannon regarding revised plan.
	327	Cannon shall complete drilling and installation of the monitor well.
	357	Cannon shall certify to EID in writing that the well was installed in accordance with the approved plan.

Days from Item Number	Signing of Agreement	Action
4	372	Cannon must submit the as-built report. It must be acceptable to EID.
5	348	Cannon samples all the monitor wells that are part of the adequate groundwater monitoring system for Appendix IX constituents. The pumps used by Cannon to purge and sample shall be acceptable to EID.
6	Day 5 of each month	Cannon submits the written progress report which briefly describes the status of each item under V.B.
7	30	Cannon submits revised Sampling and Analysis Plan. The plan includes sampling pump specifications to EID for review and comment.
	60	EID provides written comments to Cannon regarding the Sampling and Analysis Plan.
	90	Cannon shall incorporate EID's comments in the Sampling and Analysis Plan and submit the revised plan to EID.
	120	EID shall review the revised plan and provide a written response to Cannon. The Sampling and Analysis Plan must be acceptable to EID.
8	90	Cannon shall develop and submit a field logbook format.
	120	EID shall review the logbook format and provide written comments to Cannon.
	150	Cannon shall have incorporated EID's comments and submit a revised logbook format to EID for review.
	180	EID shall review the revised format and provide a written response to Cannon. The revised format must be acceptable.